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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,868	03/30/2004	Yasunori Kaneda	TSM-38	2776
24956	7590	01/24/2006	EXAMINER	
MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.			RUTZ, JARED IAN	
1800 DIAGONAL ROAD			ART UNIT	
SUITE 370			PAPER NUMBER	
ALEXANDRIA, VA 22314			2187	

DATE MAILED: 01/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/811,868	Applicant(s) KANEDA ET AL.	
	Examiner Jared I. Rutz	Art Unit 2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>01052006</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-20 as filed on 3/30/2004 are pending in the instant application. Of these, there are 6 independent claims and 14 dependent claims.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on 1/23/2004. It is noted, however, that applicant has not filed a certified copy of the 2004-015313 application as required by 35 U.S.C. 119(b).

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 4/7/2004 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.
4. The information disclosure statement (IDS) submitted on 6/27/2005 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Objections

5. **Claims 5 and 6** are objected to because of the following informalities: Both claims contain the phrase "instruction to choice". The examiner believes that this should be changed to "instruction to chose". Appropriate correction is required.
6. **Claim 7** is objected to for being in improper dependent form. Claim 7 is dependent 8, however claims may only depend from a proceeding claim.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. **Claims 10 and 11** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 10 and 11 are directed to a computer program product and a computer readable medium for storing the codes. A computer program product is non-tangible and therefore non-statutory. The claims must be directed only to the computer readable medium holding the code and not the code itself.
9. **Claims 13-18** are rejected under 35 U.S.C. 101 because the claimed invention is not drawn to a single statutory category. Claims 13-18 are directed to "a data storage apparatus management method". It is not clear if the claims are directed to the apparatus performing the method or the method performed on the apparatus.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. **Claims 1-5, 7-17, and 19** are rejected under 35 U.S.C. 102(e) as being anticipated by Swank (US 2003/0172239).

12. **Claim 1** is taught by Swank as:

- a. *A management computer. See SAN manager, item 20 of in figure 1.*
- b. *Connected through a second network to data storage apparatuses that are connected to computers through a first network. Paragraph 0194 lines 1-2 show that the manager is connected to the storage devices by a LAN, item 18 of figure 1, which is the second network. Client computers connect to the hosts 12a-12c through a network which is not shown, paragraph 0186 lines 9-10, which is the first network.*
- c. *Said management computer comprising: a storage area information collecting module which collects respective pieces of storage area information from said data storage apparatuses connected through the second network, wherein each piece of storage area information relates to storage areas provided*

by a data storage apparatus concerned. The manager gathers and correlates information about SAN components through agents associated with the hosts, paragraphs 16-20.

d. *A hierarchy information collecting module which collects respective pieces of hierarchy information from said data storage apparatuses connected through said second network, wherein each piece of hierarchy information indicates hierarchy among data storage apparatuses held by a data storage apparatus concerned.* Information regarding the storage devices available to a host is collected by the manager (paragraph 0019 lines 1-5). The host and available logical units are hierarchically configured as defined at page 8 lines 3-6 of the specification of the instant application.

e. *And a management relation information creation module which sets hierarchy among said data storage apparatuses to create management relation information, based on said pieces of storage area information and said pieces of hierarchy information collected in said storage area information collecting module and said hierarchy information collecting module.* Paragraph 0256 lines 6-13 show that the SAN manager assigns LUNs to a host. This sets the hierarchy between the hosts and the storage devices.

13. **Claim 2** is taught by Swank as:

f. *A management computer according to claim 1, wherein: said management computer further comprises: a management information creation module that recognizes a number of data storage apparatuses according to a number of said*

pieces of storage area information collected in said storage area information collecting module. Paragraph 0193 shows that the SAN manager uses the information gathered by the agents to determine the makeup and topology of the SAN and its components, thus recognizing the number of data storage apparatuses according to a number of storage area information.

g. And prepares pieces of management information used respectively for managing said data storage apparatuses. Paragraph 0193 lines 1-9 shows that the SAN manager collates the collected information to implement an administrator defined policy.

h. Wherein a number of said pieces is equal to a recognized number of data storage apparatuses. Paragraph 0020 shows that the manager uses the data gathered by each the agents, which may only be partial. This information allows the SAN manager to resolve the SAN topology. This shows that the manager determines redundant information so that the number of reported data storage apparatuses is equal to the actual number of data storage apparatuses.

i. And said management relation information creation module associates each of said data-storage apparatuses with a piece of management information used for managing the data storage apparatus in question, and adds information indicating the association to said management relation information. The gathered information is used to assign logical units in the SAN to the host devices.

14. **Claim 3** is taught by Swank as:

j. *A management computer according to claim 1, further comprising: a screen data creation module which creates hierarchy display screen data that is used for displaying said data storage apparatuses on a screen according to the hierarchy set in said management relation information creation module; and a screen data sending module which sends said hierarchy display screen data created in said screen data creation module to an output device connected to the management computer itself.* Paragraph 0195 shows that the manager includes a GUI for displaying the topology of the SAN. As this information is displayed, it is inherent that the screen data is created and sent to the monitor.

15. **Claim 4** is taught by Swank as:

k. *A management computer according to claim 3, wherein: said screen data creation module creates pieces of data storage apparatus display data for respectively specifying said data storage apparatuses in said hierarchy display screen data and adds pieces of information identifying those pieces of data storage apparatus display data to said management relation information to hold those pieces of information in said management relation information.* Paragraph 0346 shows that the GUI of the SAN manager displays components of the SAN, such as hosts and storage devices, and uses an Object Request Broker which allows the administrator to perform operations which affect management relation information.

16. **Claim 5** is taught by Swank as:

l. A management computer according to claim 4, further comprising: a management module choosing module that refers to said management relation information to extract a piece of management information corresponding to a certain piece of data storage apparatus display data that is chosen when an instruction to choice said certain piece of data storage apparatus display data is received from said output device, and sends the extracted piece of management information to said output device. Paragraph 0347 and figure 16 show that attributes of a selected storage device may be displayed. Paragraph 0348 shows that the attributes of a LUN may be displayed if the icon representing the LUN is selected.

17. Claim 7 is taught by Swank as:

m. A management computer according to claim 8, further comprising: a notification modification module that: refers to said management relation information to judge whether a data storage apparatus as a source of a status change notification is a data storage apparatus (a first type data storage apparatus) providing a storage area for storing data used by a computer or a data storage apparatus (a second type data storage apparatus) providing a storage area for storing data used by a computer through said first type data storage apparatus, when said status change notification is received from said data storage apparatus connected to said management computer through said second network. Figures 17 and 18 show that the manager differentiates

between hosts, a first type data storage, and storage devices, a second type data storage.

n. And when said data storage apparatus is judged to be said second type of data storage apparatus, refers to said management relation information to create a new display message by reflecting the hierarchy acquired from said management relation information onto contents of the received notification.

Paragraph 0472 shows that when a topological display of the SAN is requested, the updated conditions of components of the SAN are read from memory and displayed.

18. **Claim 8** is taught by Swank as:

o. A management computer connected through a second network to data storage apparatuses that are connected to computers through a first network.

See SAN manager 20. Paragraph 0194 lines 1-2 show that the manager is connected to the storage devices by a LAN, item 18 of figure 1, which is the second network. Client computers connect to the hosts 12a-12c through a network which is not shown, paragraph 0186 lines 9-10, which is the first network.

p. Wherein said management computer comprises an arithmetic unit and a memory. As the SAN manager is a computer, it is inherent that it contains an arithmetic unit, a CPU, and a memory that holds programs and other data used by the CPU.

q. *And said arithmetic unit collects respective pieces of storage area information from said data storage apparatuses connected through said second network, wherein each piece of storage area information relates to storage areas provided by a data storage apparatus concerned.* The manager gathers and correlates information about SAN components through agents associated with the hosts, paragraphs 16-20.

r. *Collects respective pieces of hierarchy information from said data storage apparatuses connected through said second network, wherein each piece of hierarchy information indicates hierarchy among data storage apparatuses held by a data storage apparatus concerned.* Information regarding the storage devices available to a host is collected by the manager (paragraph 0019 lines 1-5). The host and available logical units are hierarchically configured as defined at page 8 lines 3-6 of the specification of the instant application.

s. *sets hierarchy among said data storage apparatuses to create management relation information, based on said pieces of storage area information and said pieces of hierarchy information, and of storing the created management relation information into said memory.* Paragraph 0256 lines 6-13 show that the SAN manager assigns LUNs to a host. This sets the hierarchy between the hosts and the storage devices.

t. *And outputs said management relation information stored in said memory.* Paragraph 0346 shows that a GUI is used to display information about the SAN, therefore the data is output to the monitor.

19. **Claim 9** is taught by Swank as:

u. *A management computer according to claim 8, wherein: said arithmetic unit: a further recognizes a number of data storage apparatuses according to a number of said pieces of the collected storage area information and creates pieces of management information for respectively managing data storage apparatuses. Paragraph 0193 shows that the SAN manager uses the information gathered by the agents to determine the makeup and topology of the SAN and its components, thus recognizing the number of data storage apparatuses according to a number of storage area information.*

v. *Wherein a number of said pieces is equal to a recognized number of data storage apparatuses and storing the created pieces of management information into said memory. Paragraph 0020 shows that the manager uses the data gathered by each the agents, which may only be partial. This information allows the SAN manager to resolve the SAN topology. This shows that the manager determines redundant information so that the number of reported data storage apparatuses is equal to the actual number of data storage apparatuses.*

w. *And associates each of said data storage apparatuses with a piece of management information used for managing the data storage apparatus in question and adds information indicating the association to said management relation information, in said processing of creating said management relation information and storing the created management relation information into said*

memory. The gathered information, which includes attributes of the storage units, is used to assign logical units in the SAN to the host devices.

20. **Claim 10** Is taught by Swank as:

x. *A computer program product for a management computer connected through a second network to data storage apparatuses that are connected to computers through a first network. See SAN manager 20. Paragraph 0194 lines 1-2 show that the manager is connected to the storage devices by a LAN, item 18 of figure 1, which is the second network. Client computers connect to the hosts 12a-12c through a network which is not shown, paragraph 0186 lines 9-10, which is the first network.*

y. *Wherein said computer program product comprises: a code that collects respective pieces of storage area information from said data storage apparatuses connected through said second network, wherein each piece of storage area information relates to storage areas provided by a data storage apparatus concerned. The manager gathers and correlates information about SAN components through agents associated with the hosts, paragraphs 16-20.*

z. *A code that collects respective pieces of hierarchy information from said data storage apparatuses connected through said second network, wherein each piece of hierarchy information indicates hierarchy among data storage apparatuses held by a data storage apparatus concerned. Information regarding the storage devices available to a host is collected by the manager (paragraph*

0019 lines 1-5). The host and available logical units are hierarchically configured as defined at page 8 lines 3-6 of the specification of the instant application.

aa. A code that sets hierarchy among said data storage apparatuses to create management relation information, based on the collected pieces of storage area information and the collected pieces of hierarchy information collected.

Paragraph 0256 lines 6-13 show that the SAN manager assigns LUNs to a host. This sets the hierarchy between the hosts and the storage devices.

bb. A code that outputs the created management relation information; and a computer readable storage medium for storing the codes. Paragraph 0346 shows that a GUI is used to display information about the SAN, therefore the data is output to the monitor.

21. **Claim 11** is taught by Swank as:

cc. A computer program product according to claim 10, further comprising: a code that recognizes a number of data storage apparatuses according to a number of said pieces of the collected storage area information. Paragraph 0193 shows that the SAN manager uses the information gathered by the agents to determine the makeup and topology of the SAN and its components, thus recognizing the number of data storage apparatuses according to a number of storage area information.

dd. A code that prepares pieces of management information used respectively for managing-data storage apparatuses, wherein a number of said pieces is equals to a recognized number of data storage apparatuses. Paragraph 0020

shows that the manager uses the data gathered by each the agents, which may only be partial. This information allows the SAN manager to resolve the SAN topology. This shows that the manager determines redundant information so that the number of reported data storage apparatuses is equal to the actual number of data storage apparatuses.

ee. And a code that associates each of said data storage apparatuses with a piece of management information used for managing said data storage apparatus in question, and adds information indicating the association to said management relation information. The gathered information, which includes attributes of the storage units, is used to assign logical units in the SAN to the host devices.

22. **Claim 12** is taught by Swank as:

ff. A computer system comprising: a group of data storage apparatuses including at least one first type data storage apparatus providing a storage area for storing data used by a computer and at least one second type data storage apparatus providing a storage area for storing data used by said computer through a first type data storage apparatus. Paragraphs 0185 and 0186 show that the storage system contains first type storage apparatuses, hosts 12, and second type storage apparatuses, storage devices 14.

gg. A management computer that manages said group of data storage apparatuses. See SAN manager 20.

hh. A first network connecting between said computer and said group of data storage apparatuses. Client computers connect to the hosts 12a-12c through a network which is not shown, paragraph 0186 lines 9-10, which is the first network.

ii. A second network connecting between said group of data storage apparatuses and said management computer. The manager is connected to the storage devices by a LAN, item 18 of figure 1, which is the second network.

jj. Wherein: said management computer comprises: a storage area information collecting module which collects respective pieces of storage area information from said data storage apparatuses connected through said second network, wherein each piece of storage area information relates to storage areas provided by a data storage apparatus concerned. The manager gathers and correlates information about SAN components through agents associated with the hosts, paragraphs 16-20.

kk. A hierarchy information collecting module which collects respective pieces of hierarchy information from said data storage apparatuses connected through said second network, wherein each piece of hierarchy information indicates hierarchy among data storage apparatuses held by a data storage apparatus concerned. Information regarding the storage devices available to a host is collected by the manager (paragraph 0019 lines 1-5). The host and available logical units are hierarchically configured as defined at page 8 lines 3-6 of the specification of the instant application.

ll. and a management relation information creation module which sets hierarchy among said data storage apparatuses to create management relation information based on said pieces of storage area information and said pieces of hierarchy information collected in said storage area information collecting module and said hierarchy information collecting module. Paragraph 0256 lines 6-13 show that the SAN manager assigns LUNs to a host. This sets the hierarchy between the hosts and the storage devices.

23. **Claim 13** is taught by Swank as:

mm. A data storage apparatus management method in a management computer connected through a second network to data storage apparatuses that are connected to computers through a first network. Paragraph 0194 lines 1-2 show that the manager is connected to the storage devices by a LAN, item 18 of figure 1, which is the second network. Client computers connect to the hosts 12a-12c through a network which is not shown, paragraph 0186 lines 9-10, which is the first network.

nn. The method comprising steps of: collecting respective pieces of storage area information from said data storage apparatuses connected through said second network, wherein each piece of storage area information relates to storage areas provided by a data storage apparatus concerned. The manager gathers and correlates information about SAN components through agents associated with the hosts, paragraphs 16-20.

oo. Collecting respective pieces of hierarchy information from said data storage apparatuses connected through said second network, wherein each piece of hierarchy information indicates hierarchy among data storage apparatuses held by a data storage apparatus concerned. Information regarding the storage devices available to a host is collected by the manager (paragraph 0019 lines 1-5). The host and available logical units are hierarchically configured as defined at page 8 lines 3-6 of the specification of the instant application.

pp. And setting hierarchy among said data storage apparatuses to create arrangement relation information, based on said pieces of storage area information and said pieces of hierarchy information. Paragraph 0256 lines 6-13 show that the SAN manager assigns LUNs to a host. This sets the hierarchy between the hosts and the storage devices.

24. **Claim 14** is taught by Swank as:

qq. A data storage apparatus management method according to claim 13, further comprising steps of: recognizing a number of data storage apparatuses according to a number of said pieces of the collected storage area information. Paragraph 0193 shows that the SAN manager uses the information gathered by the agents to determine the makeup and topology of the SAN and its components, thus recognizing the number of data storage apparatuses according to a number of storage area information.

rr. Preparing pieces of management information for respectively managing data storage apparatuses, wherein a number of said pieces is equal to a

recognized number of data storage apparatuses. Paragraph 0020 shows that the manager uses the data gathered by each the agents, which may only be partial. This information allows the SAN manager to resolve the SAN topology. This shows that the manager determines redundant information so that the number of reported data storage apparatuses is equal to the actual number of data storage apparatuses.

ss. And associating each of said data storage apparatuses with a piece of management information used for managing the data storage apparatus in question and adding information indicating the association to said management relation information, in creating said management relation information. The gathered information, which includes attributes of the storage units, is used to assign logical units in the SAN to the host devices.

25. **Claim 15** is taught by Swank as:

tt. A data storage apparatus management method according to claim 18, further comprising steps of: creating hierarchy display screen data that is used for displaying said data storage apparatuses on a screen according to said management relation information; and sending said created hierarchy display screen data to an output device connected to the management computer itself.

Paragraph 0195 shows that the manager includes a GUI for displaying the topology of the SAN. As this information is displayed, it is inherent that the screen data is created and sent to the monitor.

26. **Claim 16** is taught by Swank as:

uu. A data storage apparatus management method according to claim 15, further comprising of stops of creating pieces of data storage apparatus display data for respectively specifying said data storage apparatuses in said hierarchy display screen data, when said hierarchy display screen data is created; and adding pieces of information identifying those pieces off data storage apparatus display data to said management relation information, to hold those pieces of information in said management relation information. Paragraph 0346 shows that the GUI of the SAN manager displays components of the SAN, such as hosts and storage devices, and uses an Object Request Broker which allows the administrator to perform operations which affect management relation information.

27. **Claim 17** is taught by Swank as:

vv. A data storage apparatus management method according to claim 16, further comprising a step of: referring to said management relation information to extract a piece of management information corresponding to a certain piece of data storage apparatus display data that is chosen when an instruction to choice said certain piece of data storage apparatus display data is received from said output device, and sending the extracted piece of management information to said output device. Paragraph 0347 and figure 16 show that attributes of a selected storage device may be displayed. Paragraph 0348 shows that the attributes of a LUN may be displayed if the icon representing the LUN is selected.

28. **Claim 19** is taught by Swank as:

ww. A management computer according to claim 2, wherein: said management computer further comprises; a management computer identification information collecting module which collects respective pieces of management computer identification information from said data storage apparatuses through said second network, wherein each piece of management computer identification information indicates whether a data storage apparatus concerned has been already connected to said management computer. Paragraphs 0465-0745 explain the HistoryData objects generated by the SAN manager. Paragraph 0647 lines 7-13 show that each HistoryData object includes a unique identifier the SAN object to which it pertains. One of the listed statuses that a HistoryData object can indicate is that a component is new, indicating that a data storage apparatus has not been connected to the manager before. Other states, such as Normal, indicate that a data storage apparatus has been connected to the manager before.

xx. And said management information creation module does not create a piece of management information with respect to a data storage apparatus from which said management computer identification information collecting module has collected a piece of management computer identification information indicating that said management computer is connected to said data storage apparatus. Paragraph 0471 shows that no HistoryData objects are generated for components that are in the Normal status.

Claim Rejections - 35 USC § 103

29. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

30. **Claims 6, 18, and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Swank (cited Supra) in view of IBM User Interface Architecture (December 2001).

31. **Claim 6** is taught by Swank as:

yy. A management computer according to claim 4, further comprising: a warning message creation module that: refers to said management relation information when an instruction to choice a certain piece of data storage apparatus display data is received from said output device, to extract a data storage apparatus held in said management relation information being associated with the chosen piece of data storage apparatus display data.

Making a LUN unavailable to a host is referred to as masking in Swank.

Paragraph 0354 shows that a LUN may be unassigned by selecting it using the GUI.

zz. Judges whether the extracted data storage apparatus is a data storage apparatus (a first type data storage apparatus) providing a storage area for

storing data used by a computer or a data storage apparatus (a second type data storage apparatus) providing a storage area for storing data used by a computer through said first type data storage apparatus. Paragraph 0576 warns that care must be taken to avoid a surprise remove when masking a LUN in a second type data storage apparatus.

32. *Although Swank teaches that removing a second type data storage needs to be done with care, Swank does not explicitly teach displaying a warning message when an administrator tries to extract a second type data storage apparatus.*

33. *IBM User Interface Architecture (IBM UIA) teaches on page 20 that a user interface should display a warning message to indicate that an undesirable situation in a process could occur but the user can choose to continue.*

34. *Swank and IBM UIA are analogous art because they are from the same field of endeavor, designing user interfaces that allow a user to easily interface with a system.*

35. *At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the teachings of the IBM UIA in combination with the teaching of Swank to create and send a warning message when removing a second type data storage apparatus.*

36. *The motivation for doing so would have been to keep the user out of trouble (IBM UIA page 9).*

37. *Therefore it would have been obvious to combine IBM UIA with Swank for the benefit of keeping the user out of trouble to obtain the invention as specified in claim 6.*

38. **Claim 18** is taught by Swank as:

aaa. A data storage apparatus management method according to claim 17, further comprising steps of; referring to said management piece of data storage information when an instruction to choice a certain piece of data storage apparatus display data is received from said output device, to extract a data storage apparatus held in said management relation information being associated with the chosen piece of data storage apparatus display data.

Making a LUN unavailable to a host is referred to as masking in Swank.

Paragraph 0354 shows that a LUN may be unassigned by selecting it using the GUI.

bbb. Judging whether the extracted data storage apparatus is a data storage apparatus (a first type data storage apparatus) providing a storage area for storing data used by said computer or a data storage apparatus (a second type data storage apparatus) providing a storage area for storing data used by said computer through said first type data storage apparatus. Paragraph 0576 warns that care must be taken to avoid a surprise remove when masking a LUN in a second type data storage apparatus.

39. *Although Swank teaches that removing a second type data storage needs to be done with care, Swank does not explicitly teach displaying a warning message when an administrator tries to extract a second type data storage apparatus.*

40. *IBM User Interface Architecture (IBM UIA) teaches on page 20 that a user interface should display a warning message to indicate that an undesirable situation in a process could occur but the user can choose to continue.*

41. *Swank and IBM UIA are analogous art because they are from the same field of endeavor, designing user interfaces that allow a user to easily interface with a system.*

42. *At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the teachings of the IBM UIA in combination with the teaching of Swank to create and send a warning message when removing a second type data storage apparatus.*

43. The motivation for doing so would have been to keep the user out of trouble (IBM UIA page 9).

44. Therefore it would have been obvious to combine IBM UIA with Swank for the benefit of keeping the user out of trouble to obtain the invention as specified in claim 18.

45. **Claim 20** is taught by Swank as:

ccc. A computer system comprising: a computer. The client computers discussed in paragraph 0186 lines 9-10.

ddd. Data storage apparatuses. Items 14a-14c of figure 1

eee. A management computer that manages said data storage apparatuses. SAN manager 20 of figure 1.

fff. A first network connecting between computers and said data storage apparatuses. Client computers connect to the hosts 12a-12c through a network which is not shown, paragraph 0186 lines 9-10, which is the first network.

ggg. A second network connecting between said data storage apparatuses and said management computer. Paragraph 0194 lines 1-2 show that the manager is connected to the storage devices by a LAN, item 18 of figure 1, which is the second network.

hhh. And a management console connected to said management computer. Paragraph 0022 shows that the SAN manager includes a GUI. Paragraph 0195 shows that consoles are present to present/accept information to/from an operator.

iii. Wherein: said data storage apparatuses includes: one or more first type data storage apparatuses each providing storage areas for storing data used by said computers. Paragraph 0186 lines 9-13 show that the storage system contains first type storage apparatuses, hosts 12, which provide data access to the client computers.

jjj. And one or more second type data storage apparatuses each providing storage areas for storing data used by said computers through a storage area of said first type data storage apparatuses. Paragraph 0186 lines 9-13 show that the storage devices provide storage for the hosts.

kkk. Said management computer comprises: a storage area information collecting module which collects respective pieces of storage area information

from said data storage apparatuses, wherein each piece of storage area information relates to storage areas provided by a data storage apparatus concerned. The manager gathers and correlates information about SAN components through agents associated with the hosts, paragraphs 16-20. Paragraph 0020 shows that the manager uses the data gathered by each the agents, which may only be partial. This information allows the SAN manager to resolve the SAN topology. This shows that the manager determines redundant information so that the number of reported data storage apparatuses is equal to the actual number of data storage apparatuses.

III. A management information creation module that recognizes a number of data storage apparatuses according to a number of said pieces of storage area information collected in said storage area information collecting module and prepares pieces of management information used respectively for managing said data storage apparatuses, wherein a number of said pieces is equal to a recognized number of data storage apparatuses. Paragraph 0193 shows that the SAN manager uses the information gathered by the agents to determine the makeup and topology of the SAN and its components, thus recognizing the number of data storage apparatuses according to a number of storage area information.

mmm. A hierarchy information collecting module which collects respective pieces of hierarchy information from said data storage apparatuses, wherein each piece of hierarchy information indicates hierarchy among data storage

apparatuses held by a data storage apparatus concerned. Information regarding the storage devices available to a host is collected by the manager (paragraph 0019 lines 1-5). The host and available logical units are hierarchically configured as defined at page 8 lines 3-6 of the specification of the instant application.

nnn. A management relation information creation module which sets hierarchy among said data storage apparatuses to create management relation information, based on said pieces of storage area information, said pieces of management information and said pieces of hierarchy information collected in said storage area information collecting module, said management information creation module and said hierarchy information collecting module. Paragraph 0256 lines 6-13 show that the SAN manager assigns LUNs to a host. This sets the hierarchy between the hosts and the storage devices.

ooo. A screen data creation module that: creates hierarchy display screen data that is used for displaying said data storage apparatuses according to the hierarchy set in said management relation information creation module and pieces of data storage apparatus display data for respectively specifying said data storage apparatuses in said hierarchy display screen data, and adds pieces of information identifying those pieces of data storage apparatus display data to said management relation information. Paragraph 0348 discusses figure 17, which shows the GUI displaying the storage apparatuses and the hosts using LUNs in the storage apparatus, which indicates the hierarchy between the storage apparatuses and the hosts.

ppp. A screen data sending module which sends said hierarchy display screen data created in said screen data creation module and said data storage apparatus display data to said management console. As the GUI is displayed, it is inherent that it is sent to the screen by a screen data sending module.

qqq. A warning message creation module that: refers to said management relation information when an instruction to choice a certain piece of data storage apparatus display data is received from said management console, to extract a data storage apparatus held in said management relation information being associated with the chosen piece of data storage apparatus display data.

Making a LUN unavailable to a host is referred to as masking in Swank.

Paragraph 0354 shows that a LUN may be unassigned by selecting it using the GUI.

rrr. Judges whether the extracted data storage apparatus is a first type data storage apparatus or a second type data storage apparatus; and when the extracted data storage apparatus is judged to be said second type of data storage apparatus. Paragraph 0576 warns that care must be taken to avoid a surprise remove when masking a LUN in a second type data storage apparatus.

sss. A management module choosing module that refers to said management relation information to extract a piece of management information corresponding to a certain piece of data storage apparatus display data that is chosen when an instruction to choice said certain piece of data storage apparatus display data is received from said management console and sends the extracted piece of

management information to said management console. Paragraph 0347 and figure 16 show that attributes of a selected storage device may be displayed. Paragraph 0348 shows that the attributes of a LUN may be displayed if the icon representing the LUN is selected.

ttt. A notification modification module that: refers to said management relation information to judge whether a data storage apparatus as a source of a status change notification is a first type data storage apparatus or a second type data storage apparatus, when said status change notification is received from said data storage apparatus (i.e., said source of the status change notification); and when said data storage apparatus is judge to be said second type of data storage apparatus, refers to said management relation information to create a new display message by reflecting the hierarchy acquired from said management relation information onto contents of the received notification; and a modification notification sending module which sends the display message created in said notification modification module to said management console. Figure 26 and paragraph 0466 show that changes to the SAN hierarchy are reflected in the GUI.

uuu. Said management console comprises: a display module which displays the display data received from said management computer. Paragraph 0195 shows that the SAN manager uses the GUI to drive information to the console.

vvv. An instruction receiving module which receives an instruction from an administrator through said display module, And an instruction sending module

which sends an instruction received from the administrator through said instruction receiving module to said management computer. Paragraph 0195 shows that the SAN manager can receive operator commands through the consoles.

www. Said display module comprises a hierarchy display area and a status change notification information display area. Figure 17 shows the hierarchy information, in the column labeled Host Name in item 106, which indicates which hosts are using the selected storage apparatus. The column labeled Status in item 106 shows the status of each host, and paragraph 0466 shows that the newly added components can be color coded, which indicates the change in their status.

xxx. Said hierarchy display area displays said hierarchy display screen data and said data storage apparatus display data. Figure 16 shows the storage device and information about the storage device.

yyy. And said status change notification information display area displays the display message received from said modification notification sending module.

Paragraph 0466 shows that the newly added components can be color coded on the display, which indicates the change in their status.

46. Although Swank teaches that removing a second type data storage needs to be done with care, Swank does not explicitly teach displaying a warning message when an administrator tries to extract a second type data storage apparatus.

47. *IBM User Interface Architecture (IBM UIA) teaches on page 20 that a user interface should display a warning message to indicate that an undesirable situation in a process could occur but the user can choose to continue.*

48. *Swank and IBM UIA are analogous art because they are from the same field of endeavor, designing user interfaces that allow a user to easily interface with a system.*

49. *At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the teachings of the IBM UIA in combination with the teaching of Swank to create and send a warning message when removing a second type data storage apparatus.*

50. The motivation for doing so would have been to keep the user out of trouble (IBM UIA page 9).

51. Therefore it would have been obvious to combine IBM UIA with Swank for the benefit of keeping the user out of trouble to obtain the invention as specified in claim 20.

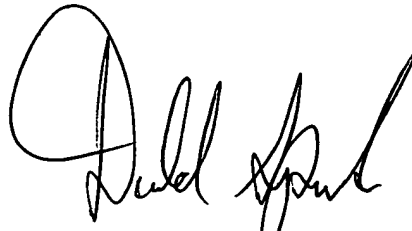
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jared I. Rutz whose telephone number is (571) 272-5535. The examiner can normally be reached on M-F 8:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald Sparks can be reached on (571) 272-4201. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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jir

A handwritten signature in black ink, appearing to read "Donald Sparks", written over a printed name and title.

DONALD SPARKS
SUPERVISORY PATENT EXAMINER

Jared I Rutz
Examiner
Art Unit 2187